

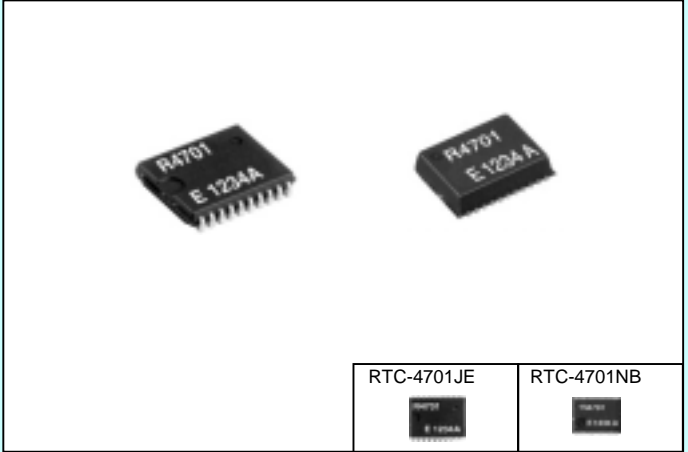
Built-in Temperature Sensor SERIAL-INTERFACE REAL TIME CLOCK MODULE RTC - 4701 JE / NB

Product Number (please refer to Application guide)

RTC - 4701 JE : Q41470171000200

RTC - 4701 NB : Q41470191000200

- Built-in 32.768 kHz quartz oscillator : Frequency adjusted for high accuracy. (± 5 × 10⁻⁶)
- Interface Type : Serial interface in 3 lines form.
- Operating voltage range : 1.6 V to 5.5 V
- Wide Timekeeper voltage range : 1.6 V to 5.5 V
- Built-in temperature sensor : Detects temperature. Convert of output to analog voltage
- 32.768kHz frequency output function : C-MOS output With Control Pin
- Function of time and calendar, the various interrupt function etc.
- Comply with EU RoHS directive

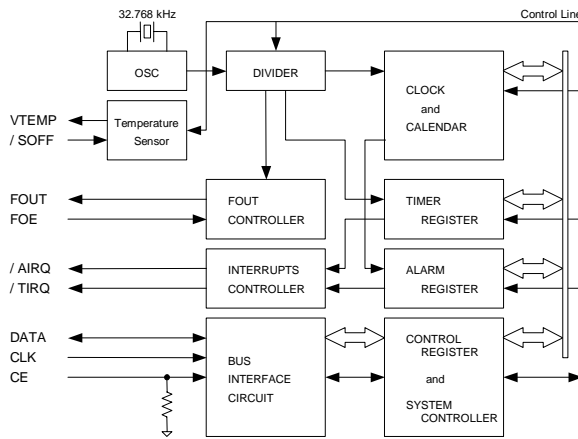


* The details are mentioned in the application manual.

<http://www.epsondevice.com>

Actual size

Block diagram



Overview

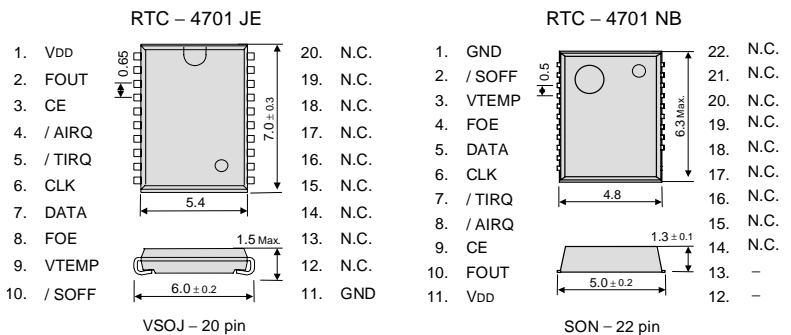
- Built-in temperature sensor
 - Diode temperature sensor (analog voltage output)
 - * temperature sensor operating voltage : 2.7 V to 5.5 V
 - * temperature sensor tolerance : ± 5 °C (Ta = +25 °C)
 - * voltage output (analog) : -7.6 mV / °C Typ.
- 32.768kHz frequency output function
 - FOUT pin output (C-MOS output), CL=30pF
 - FOE pin enables output on/off control.
- The various interrupt function
 - 12 bit additional counter. (to 4095 count)
 - Timer function can be set up between 1/4096 second and 255 minutes.
 - Alarm function can be set to day of week, day, hour, or minute.

* A part of function differs from RX - 4702 LC

Pin Function

Signal Name	Input / Output	Function						
CE	Input	The chip enabled input pin. (Built-in pull-down resistance)						
CLK	Input	The shift clock input pin for serial data transfer.						
DATA	Bi-directional	The data input / output pin for serial data transfer.						
FOUT	Output	<table border="1"> <thead> <tr> <th>FOE input</th> <th>FOUT output</th> </tr> </thead> <tbody> <tr> <td>"H"</td> <td>32.768 kHz output * C-MOS output</td> </tr> <tr> <td>"L"</td> <td>output OFF * Hi-z</td> </tr> </tbody> </table>	FOE input	FOUT output	"H"	32.768 kHz output * C-MOS output	"L"	output OFF * Hi-z
FOE input	FOUT output							
"H"	32.768 kHz output * C-MOS output							
"L"	output OFF * Hi-z							
FOE	Input							
VTEMP	Output	The voltage output pin for the temperature sensor (analog).						
/SOFF	Input	The input pin for the temperature sensor control.						
/AIRQ	Output	Output 1 pin (N-ch open drain)						
/TIRQ	Output	Output 2 pin (N-ch open drain)						
VDD	-	Connected to a positive power supply.						
GND	-	Connected to a ground.						

Terminal connection / External dimensions (Unit : mm)



Metal may be exposed on the top or bottom of this product. This won't affect any quality, reliability or electrical spec.

Temperature sensor characteristics

* If not specifically indicated, GND = 0 V , VDD = 2.7 V to 5.5 V , Ta = -40 °C to +85 °C

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Temperature output voltage	VTEMP	VTEMP pin, Ta = +25 °C GND based output voltage		1.480		V
Output tolerance	TACR	Ta = +25 °C			± 5.0	°C
Temperature sensitivity	VSE	-40 °C ≤ Ta ≤ +85 °C	-7.1	-7.6	-8.1	mV / °C
Linearity	ΔNL	-40 °C ≤ Ta ≤ +85 °C			± 2.0	%
Temperature detection range	TSOP	ΔNL ≤ ± 2.0 %	-40		+ 85	°C
Output resistance	Ro	VTEMP pin, Ta = +25 °C GND standard and VDD standard		1.0	3.0	kΩ

* Temperature sensitivity $VSE = (V(+85 °C) - V(-40 °C)) / 125 [mV / °C]$

* Linearity $\Delta NL = \frac{a}{b} \times 100 [\%]$
 a : Maximum deviation between the measured value of VTEMP and approximate straight line.
 b : Difference between the measured values at -40 °C and +85 °C.

* Output resistance (Ro) $Ro = \frac{\Delta V_1}{\Delta I_1} [\Omega]$

